TECHNOLOGY ENHANCED LEARNING

An Action Plan for Post-Secondary Education and Training in Saskatchewan

Phase 2
June 30, 2000

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I. Introduction

This report proposes a framework for an Action Plan for Technology Enhanced Learning (TEL) to be implemented over the next five years within post-secondary education and training in Saskatchewan. The Action Plan stems from a consensus among post-secondary institutions, government departments, and associated agencies about the need for province-wide, coordinated action to make effective use of TEL. Through the participation of many partners, the plan represents a collaborative effort to increase access and quality in the post-secondary system by building on existing strengths, developing complementary roles, undertaking joint initiatives, and sharing resources.

Phase 1 for development of the Action Plan was initiated in 1997-98 with a provincial planning session on technologies in learning and a discussion paper on key issues, challenges and priorities. The discussion paper, produced by a working group with members from several institutions and agencies, led to further dialogue at the senior management level on organizational interest in and commitment to pursuing a TEL strategy based on collaboration to achieve shared goals.

The next steps in developing the TEL Action Plan are aimed at translating broad vision and principles into concrete direction. Phases 2 and 3 are as follows:

- Phase 2: Drafting of a policy framework for collaborative action, including the context and rationale for improving Saskatchewan's capacity for TEL, a vision and goals to guide this development, and strategies to achieve the goals. Actions to implement the plan are described in broad terms and resources implications are considered. This report presents the results of Phase 2.
- Phase 3: Detailed development of specific priority actions to be undertaken and their associated costs, and agreement regarding roles and responsibilities for implementation. This phase in developing the plan will involve further consultation with post-secondary institutions and related agencies in identifying ways in which they can collaborate through joint projects and coordinated efforts.

A key part of implementing the plan is a proposed five-year federal-provincial partnership agreement. The federal government is playing a major role in supporting development of the technological infrastructure, expertise and skills that all regions of the country will need to prosper in the future. This national thrust presents an opportunity for Saskatchewan to work with the federal government to advance mutual social and economic goals through cooperation in TEL.

Development of the TEL Action Plan for post-secondary education and training involves collaboration and consultation among the following organizations:

- University of Regina and University of Saskatchewan
- Saskatchewan Institute of Applied Science and Technology (SIAST)
- Regional Colleges
- Apprenticeship and Trades Certification Commission
- Saskatchewan Indian Federated College (SIFC) and the Saskatchewan Indian Institute of Technologies (SIIT)
- Gabriel Dumont Institute (GDI) and Dumont Technical Institute (DTI)
- Saskatchewan Post-Secondary Education and Skills Training
- Saskatchewan Education
- Information Technology Office, Economic Development and Cooperative Development
- Provincial Library
- Fransaskois post-secondary education
- Industry Canada
- Human Resources Development Canada
- Saskatchewan Communications Network (SCN)
- SaskTel

II. Context For TEL Application In Saskatchewan

1. The Purposes of Post-Secondary Education and Training

Since their inception, Saskatchewan's universities, technical institutes and colleges have played a central role in shaping the social, cultural and economic destiny of the province and in preparing its citizens to deal with ongoing change. The province relies on their contributions of knowledge, teaching and community service to enrich our quality of life, to promote equity and to create economic growth.

Today, global economic, social, political and technological forces of change are having significant impacts on the province, the nation and the post-secondary sector. While these forces are transforming our society, the key functions of post-secondary education will continue to be as relevant as they ever were. These key functions are as follows: [1]

- To inspire and enable individuals to develop their capabilities to the highest potential level throughout their life;
- To advance, preserve, and disseminate knowledge and understanding;
- To serve the knowledge and skills development needs of an adaptable, sustainable, knowledge-based economy at the local, regional, and national levels;
- To foster the application of knowledge and understanding to the benefit of the economy and society;
- To help shape a healthy, democratic, civil society.

Within this broad context, the TEL Action Plan focuses on how technology can be used to support post-secondary education in fulfilling these key functions in Saskatchewan in the future. It is not concerned with promoting technology itself or with applying technology for ends that are not rooted in the fundamental purposes of post-secondary education.

2. Shift to a Global Education Environment

Education and training in Saskatchewan and elsewhere are being profoundly affected by advances in information technologies and telecommunications systems throughout the world. Growing availability of the Internet, satellite and wireless networks, CD-ROMs, video-conferencing, multi-media software and other

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[1] Adapted from *A Report on Public Expectations of Post-Secondary Education in Canada*, Council of Ministers of Education (CMEC), 1999.

technologies are opening up new possibilities to enhance access and quality within the post-secondary sector. At the same time, demands for advanced education and continuous learning are increasing at rates that challenge the ability of public institutions and industry to meet them. Technological advances, along with rising demands for education, are creating a new global learning environment. The barriers of time and distance are giving way to innovative, flexible approaches that use technology to meet the needs of learners, communities, the workplace and post-secondary institutions.

Use of technologies to facilitate or enhance learning and to design and deliver educational programs is increasing exponentially. Across the globe, post-secondary institutions are routinely supplementing their courses with e-mail and electronic learning resources and many are offering courses and programs on-line. Recent studies suggest that anywhere from 17,000 to 40,000 courses were offered on-line in 1998, with 75% originating in the United States and 16% in Canada. It is estimated in Canada that at least 90,000 students are currently taking on-line courses. These figures will be significantly higher in 2000 and beyond.

Forecasts of this nature are being driven by improvements in technology that support applications in education, such as:

- Growing access to high speed internet with capability to transmit complex information, such as 3D graphics, animation, or large data bases, in a timely way;
- Dramatic increases in bandwidth at lower costs in regions outside of large urban centres, supporting access for learners in rural and remote locations;
- Increased compatibility in networking and conferencing technologies, allowing greater connectivity among different users and collaboration among institutions;
- Improved standards and software tools for presentations, curriculum development, and support services, making it easier for educators to produce, share and adapt technology enhanced courses and related learning resources;
- Development of multiple modes of communication that can be combined or integrated to meet a spectrum of educational or instructional requirements.

Increasing experience and knowledge in applying the new technologies for educational purposes are also fueling growth in applications. There is growing evidence from worldwide research that appropriate use of TEL can be as effective as traditional face-to-face classroom instruction, and can support higher levels of learning, such as analysis, synthesis, problem solving, and decision-making. Rather than viewing TEL as "second best" or peripheral, many institutions are adopting TEL as central to the achievement of their academic mission for student learning.

The expansion of technology enhanced learning in the future has many implications for post-secondary students, educators and administrators in Saskatchewan and elsewhere:

Greater Choice and Competition:

Students will have much greater choice to enroll in courses from many sources at times and locations convenient to them and with content or instructional approaches that best fit their particular interests. The result will be pressures on post-secondary institutions to recognize credits and learning from a variety of sources and to assist students in making informed selections out of the thousands of on-line options.

With greater choice comes greater competition. A recent study of the use of educational technologies has estimated that Canadian institutions may lose 10 to 20% of their traditional undergraduate population to distance learning (TEL) programs offered by domestic or foreign universities, colleges or the private sector. For example, Athabasca University's on-line MBA program, established five years ago, today is the largest MBA program in Canada in terms of enrolment.

New Institutional Alliances:

Technology is spurring innovation in institutional relationships and alliances. There are numerous examples in North America and other countries where post-secondary institutions are forming consortia or partnerships, rather than competing with each other, to offer their constituents an expanded array of learning options. For example, the British government recently announced the formation of "e-University", jointly owned and operated by a consortium of higher educational institutions working with the private sector and overseas partners, to expand Britain's share of the global higher education market and to provide lifelong learning opportunities to its citizens.

In Canada, Athabasca University and the British Columbia Open Learning Agency have proposed the establishment of a Canadian Virtual University. Across the western provinces, twelve universities are creating a consortium to develop a web-site for students and advisors to access information about TEL courses and to collaborate in marketing their programs. The eventual goal is to provide seamless access to courses from member institutions.

Integration of Technology:

TEL is being integrated into the mainstream of institutional programming, becoming an expected part of instruction, rather than an anomaly, and a means of serving both on and off-campus students. Some studies have found that the majority of students enrolled in on-line courses are on-campus, having selected this option because of its flexibility and convenience.

The conventional use of technology as a means of distance education or extension programming is breaking down in institutions as courses for all students incorporate technology and are adaptable for delivery in different settings and formats. For this

reason, the term "distributed learning" is beginning to replace that of "distance education". The following definition describes the distributed learning model:

> *"A distributed learning environment is a learner-centred approach to education, which integrates a number of technologies to enable opportunities for activities and interaction in both asynchronous and real-time modes. The model is based on blending a choice of appropriate technologies with aspects of campus-based delivery, open learning systems and distance education. The approach gives instructors flexibility to customize learning environments to meet the needs of diverse student populations, while providing both high quality and cost-effective learning."*[2]

Changing Role of Faculty:

As in many highly skilled jobs based on the creation, use and transmission of knowledge, technology is becoming an integral part of the work of post-secondary educators. Technology enhanced learning presents a range of challenges and opportunities for faculty. Involvement in creating TEL courses and learning resources requires the application of technical and instructional design skills in new ways.

The use of technology itself as a medium for teaching is changing the role of faculty and their interaction with students. For example, many have found that e-mail communication can make faculty more accessible to students and can facilitate more dialogue among students than conventional classroom instruction. Other implications include a greater emphasis for faculty on challenging and guiding students through curricula offered by their institution as well as others. While TEL offers these benefits, it can also significantly increase faculty workload if not planned and used properly.

Costs Of TEL:

TEL requires investments by public institutions that will not be offset by reduced costs in other areas or immediate savings that can be re-invested to defray new expenditures. While private sector companies are entering the global education market because of opportunities for profit in specialized areas, public institutions are not in the same position to raise funds for investment or to charge tuitions based on market demand. Nor can public institutions with mandates to serve broad societal

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[2] Institute for Academic Technology, University of North Carolina, March, 1995, quoted in Centre For Educational Technology Steering Committee, *A Vision Statement For Distributed Learning At UBC*, September 23,1996.

and economic objectives narrow their use of TEL only to fields where it is possible to generate revenues. For example, universities in Saskatchewan have responsibilities for knowledge creation, as well as teaching across a broad range of academic and professional disciplines.

Studies of TEL have concluded that "under the right circumstances new technologies can lead to improved cost-effectiveness by enabling new target groups to be reached and higher-quality learning outcomes to be gained at lower marginal cost per student than conventional classroom methods. To achieve these gains in cost-effectiveness, though, teaching and learning need to be substantially reorganized." [3]

TEL will require institutions to make decisions about where they direct their resources based on a careful balancing of several considerations, encompassing public expectations, educational methodologies, operational capacity, and financial viability.

3. TEL and Saskatchewan's Future

Saskatchewan is experiencing major social and economic changes that are influencing post-secondary education and training and the constraints and opportunities facing institutions. The Action Plan for TEL is being shaped within this context to ensure that the future use of technology addresses provincial realities and assists post-secondary institutions in responding effectively to the changing needs of their constituents.

Increasing Public Demands For Post-Secondary Education and Training

Public demands for post-secondary education and training are expected to increase in Saskatchewan in the coming years. Rising knowledge and skill requirements to participate in the labour market and society in general are fueling this demand. Of the 70,000 job openings forecast for Saskatchewan in the next five years, approximately 60% will require post-secondary education and training, and virtually all jobs will require a high school standing. Job openings include new positions created through growth in the economy, as well as vacancies due to people leaving existing jobs for reasons such as retirement and out-migration.

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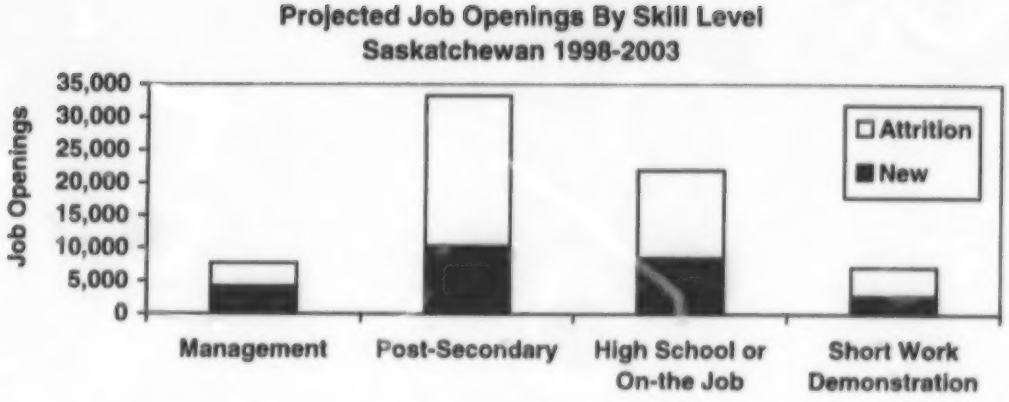
[3] Bates, A.W. *Managing Technological Change: Strategies for College and University Leaders.* San Francisco: Josse-Bass Inc., 2000, page 1.



Source: *Canada-Saskatchewan Strategic Initiatives Employment Forecast, based on Canadian Occupational Projection System*, June, 1999.

Demographic changes in the province add another dimension to this scenario. The province's total youth population 15 to 24 years old is forecast to grow very modestly. However, a greater proportion of youth than in the past will be seeking advanced education or training credentials as job entry requirements increase. Expansion of post-secondary systems in other provinces, along with the dismantling of barriers to inter-provincial mobility for students and workers, will draw people out of Saskatchewan if they cannot gain access here to high quality, relevant post-secondary opportunities.

The issue of keeping students, graduates and well-qualified personnel in the province will become more pressing in the next decade. Saskatchewan's labour supply is forecast to decline due to aging of the population and inter-provincial migration. Shortages in a series of skilled occupations are likely to emerge. Some are already evident in fields such as health care and information technology. In the university sector, large numbers of retirements will lead to intense national competition for new faculty.

The aging of the province's population also signals increasing demands from adults who are already in the work force. Many of them will be seeking to renew their knowledge and skills in response to changes in occupations and the labour market. These individuals have different learning needs and personal circumstances than sequential students who have just left high school; for example, employed adults often cannot move to attend a program and need to combine work, study and family obligations. They also tend to be more self-directed, independent learners who are more successful in distance education classes.

TEL will help address these challenges in Saskatchewan by:

- Offering a means to increase the capacity of institutions to meet growing demands for access to a variety of post-secondary programs and learning opportunities;
- Enhancing the quality and attractiveness of Saskatchewan's post-secondary programs and services to students, faculty and graduates;
- Facilitating education and training in formats and at times and locations that suit the needs of adult learners.
- Providing learning resources that can assist students in making the transition to post-secondary education and improving their retention rate in programs;
- Providing additional ways to raise basic education levels throughout the population.

Economic Development and Diversification

Saskatchewan's economy is facing challenges to restructure and diversify in response to the emergence of a global knowledge-based economy where expertise and technology are the most important growth factors. Our resource industries, such as agriculture and resource extraction, are facing intense competition, while new economic opportunities are opening up to provide goods and services to worldwide markets. Distance, time and location are being overcome by improved telecommunications and transportation.

The new economic growth factors present the province with many opportunities to build on its unique resources and strengths to create jobs and wealth in the global economy. These strategic economic sectors include:

- Agricultural and Food Processing and Agribusiness
- Biotechnology
- Environmental Management Technologies
- Health Sciences
- Toxicology
- Petroleum Engineering
- Information and Communications Technologies
- E-Commerce Development
- Advanced Manufacturing Technologies
- Tourism and Culture

- Value-Added Forestry
- Mining and Energy

The ability of the province to take advantage of these opportunities will depend on developing a well-qualified workforce with opportunities and skills for continuous learning, enhanced research and development capabilities, and synergies between industry, post-secondary institutions, and the public sector to turn ideas into economic activity.

Saskatchewan has foundations in place to link education and training with emerging economic opportunities. Research Parks at the University of Regina and the University of Saskatchewan support private and public sector partnerships for innovation in strategic economic areas and are a focal point for attracting researchers and faculty who are making significant contributions to the advancement of knowledge and technology transfer. The newly created, industry-led Apprenticeship and Trade Certification Commission has a mandate to strengthen technical and trades training and updating in response to changes in Saskatchewan's industries and the workplace. SIAST has established several partnerships and joint programs with industry to develop new technical programs in growth sectors.

TEL could support and build on these strengths by:

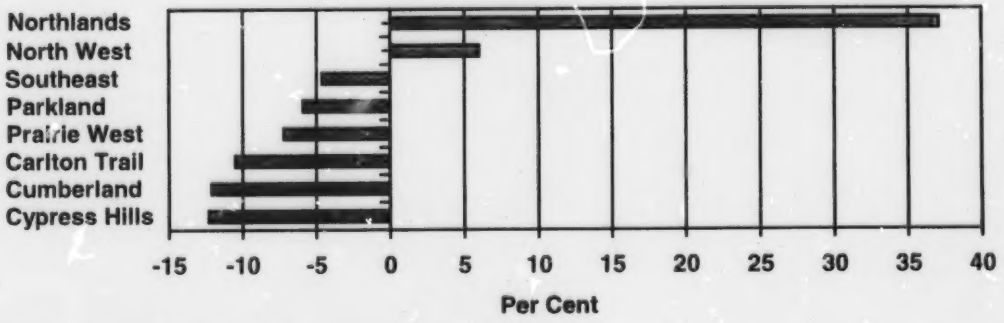
- Enhancing post-secondary courses and programs that reflect Saskatchewan's unique economic strengths for delivery in the province and to reach national and international education markets;
- Facilitating worldwide access for Saskatchewan people to specialized post-secondary education and training not available from provincial institutions, allowing learners to benefit from strengths and investments in education in other jurisdictions;
- Supporting the acquisition of skills and proficiencies in using information technologies throughout the student population and the workforce;
- Enabling education and training in the workplace so that ongoing learning, skills acquisition and updating are practical and feasible for employers and employees;
- Providing learning resources and opportunities for First Nations and Métis, northern and rural communities to enhance their economic development and diversification.

Learning Opportunities For Saskatchewan's Rural and Northern Communities

Saskatchewan faces major challenges in providing access to learning opportunities in rural and northern areas. The long-term trend of gradual population loss from

rural areas in the southern half of the province is expected to continue with restructuring in agriculture. In contrast, the northern half of the province is experiencing rapid growth with a small but relatively young population. The figure below shows these population changes over the past fifteen years in areas served by the province's regional colleges:

Population of Regional Colleges Service Areas, Per Cent Change, 1983-1998



Source: Saskatchewan Health, Covered Population, 1998

Even though urbanization is a fact of life, Saskatchewan still has a decentralized population with the majority of residents living and working outside of the four major urban centres of Regina, Saskatoon, Prince Albert and Moose Jaw. As shown below, over one half of Saskatchewan's population, labour force and employers are located in rural and northern regions.

Rural and Urban Distribution of Saskatchewan Population and Employment

	Major Urban Centres (%)	Rural/North (%)
Population	44.6	55.4
Employers	41.2	58.8
Labour Force	45.9	54.1
Paid Employees	51.9	48.1

Source: Labour Market Information, Canada-Saskatchewan Strategic Initiatives, *Regional Profiles and Community Facts*, Statistics Canada, 1996 Census, and Business Registry, 1998.

The distribution of over half of the province's residents over a large geographic area presents a dilemma for post-secondary institutions, learners and their families, employers, and communities. Saskatchewan's post-secondary sector has developed a high level of cooperation among institutions to make learning opportunities available in communities throughout the province, for example through brokerage arrangements between the regional colleges and SIAST and the universities. This mechanism, however, has limits. Many courses cannot be offered

off-campus because of a lack of facilities and qualified instructors. As well, there may not be sufficient enrolments at individual sites to make offering a broad array of courses financially viable.

Learners from rural and northern areas have the same aspirations to attend post-secondary education and training as their urban counterparts. However, living away from home adds significantly to their costs. During the recent provincial public consultation process on financial accessibility to post-secondary education, this factor was the top barrier identified by rural and northern residents.

Rural and northern employers need on-the-job training and access to qualified workers to keep pace with economic and technological change. Their capacity to support skills training, either in-house or through the purchase of services, is limited by their size and scale of operations. Almost 70% of rural and northern employers have four or fewer employees.

Communities outside of the major urban centres are endeavoring to strengthen their capacity and infrastructure to deal with economic and social changes that are influencing their future and sustainability. Formal and informal education and training are seen as critical to acquiring the knowledge and skills needed to take advantage of the opportunities emerging through advances in technology and telecommunications. These communities are challenged in their ability to utilize technology as a tool for economic development and to enhance their quality of life.

TEL could play a key role in addressing the particular challenges facing rural and northern Saskatchewan by:

- Enabling local access to an expanded array of post-secondary options from Saskatchewan institutions that can be offered independent of current barriers associated with face-to-face classes in rural and northern areas;
- Supporting learners in gaining access to post-secondary courses and programs from outside of the province that suit their specific individual needs or circumstances;
- Extending access to a variety of skill training opportunities in rural and northern workplaces to overcome the disadvantages facing employers who cannot mount training on their own or send workers away for an extended period of time for training.
- Contributing to building the capacity of small communities to undertake economic and social development initiatives.

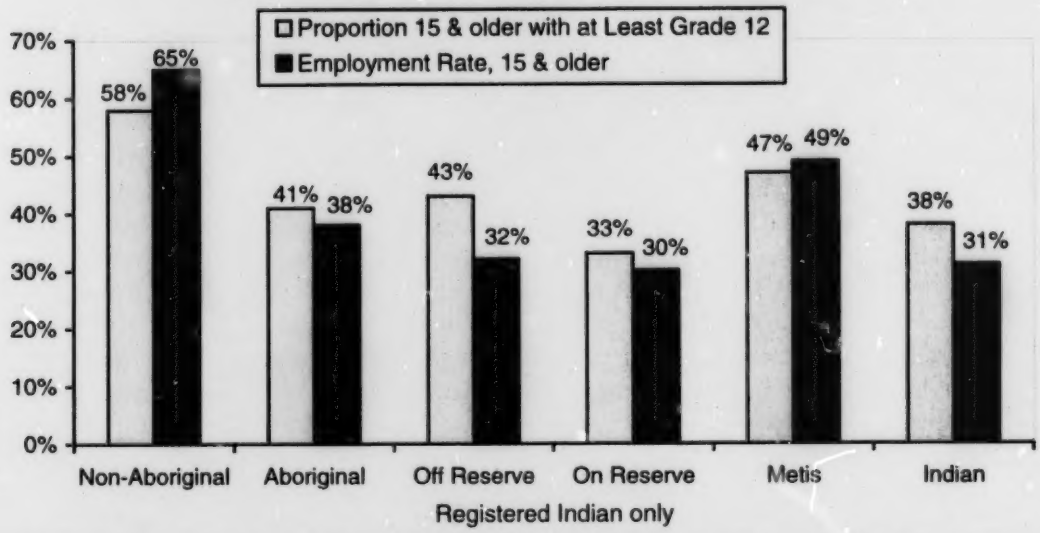
Meeting First Nations And Métis Needs For Education and Training

Saskatchewan's First Nations and Métis population is expected to grow steadily beyond its current level of approximately 12% of residents. In the younger age

groups, about 25% of youth are of First Nations or Métis ancestry. This proportion is forecast to increase to 1 in 3 by 2010, representing a major opportunity for the province to develop its future workforce and citizenry.

The imperative facing the province today is to close the gap between First Nations and Métis rates of participation in education, training and the labour force and the rest of the provincial population. The figure below illustrates this gap.

Employment Rates and Formal Education Levels, Saskatchewan 1996, Aboriginal and Non-Aboriginal Populations



Source: Doug Elliott, Sask Trends Monitor, *Saskatchewan Labour Market Trends,* Prepared for Saskatchewan Post-Secondary Education and Skills Training, 1999. Special tabulation from 1996 Census.

Labour market forecasts for the province have underlined the importance of this issue. A general shortage of skilled workers, and specific shortages in many occupational fields, are forecast to emerge during the next decade due to aging of the population and migration patterns. Because almost all of the growth between 1998 and 2013 in the working age population will occur through increases in the First Nations and Métis groups, their participation in education and employment will be the key to preventing shortages.

First Nations and Métis people in Saskatchewan have established post-secondary institutions that are recognized nationally and internationally for their models of operation and programs and services. These include the Saskatchewan Indian Federated College, the Saskatchewan Indian Institute of Technologies, the Gabriel Dumont Institute and the Dumont Technical Institute. Like provincial institutions, these First Nations and Métis organizations are also challenged in serving their communities. They are stretched to meet a diversity of learning needs across the

province and to develop programs that are culturally relevant in terms of their content, instructional design and learning resources.

TEL could address First Nations and Métis education and training needs by:

- Enabling First Nations and Métis learners to complete the first year or two of programs in their home communities, contributing to their long-term success in achieving post-secondary education;
- Providing a means to offer courses and programs specifically tailored to the needs of First Nations and Métis students and communities;
- Supporting the development of an enhanced national capacity for First Nations and Métis education and training that would benefit people in Saskatchewan as well as First Nations and Métis people in other provinces.

Social Equity

As information and telecommunications technologies become more influential in the economy and society, the "haves" and "have nots" of the future will be determined by access to and ability to use technology. The primacy and wealth of regions and nations on a global scale are being redefined based on concentrations of technological infrastructure and expertise. Similarly, at the community and provincial levels, technology is emerging as a factor that can work to reinforce or ameliorate social, cultural and economic differences. According to a recent report from the U.S. Department of Commerce, "The "digital divide" – the divide between those with access to new technologies and those without – is now one of America's leading economic and civil rights issues." [4]

Recent surveys have reported that more than 45% of Saskatchewan households have a computer and, according to SaskTel, approximately 30% had Internet service in May, 1999. When points beyond the home are taken into account, an estimated 70 to 80% of Saskatchewan people have access to the internet through the home, work, school or community sites. Compared to the rest of Canada, Saskatchewan's adoption of computers and the internet is slightly below the national average and more noticeably lagging when compared to Alberta, British Columbia and Ontario.

Use of the Internet is highly correlated with education, income and employment levels. As illustrated in the following figure, there are large disparities in Saskatchewan. Households where the head has a university education and income is $60,000 or more are the highest users (85%), while only a small minority of

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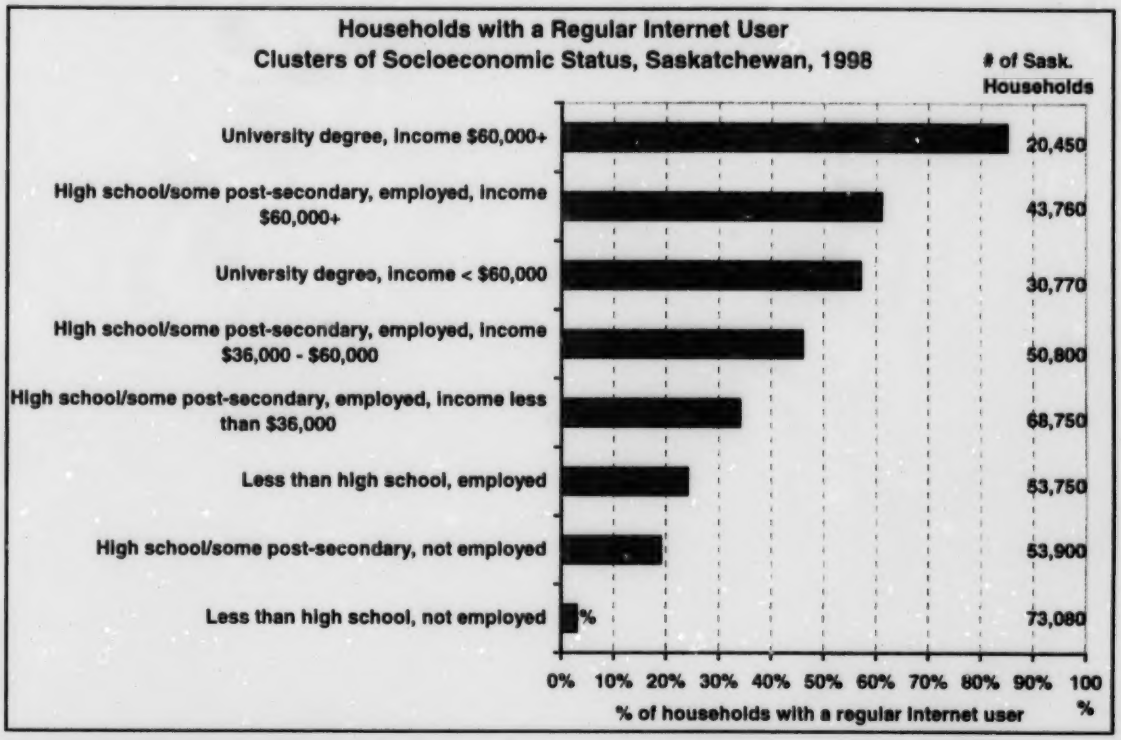
[4] *Falling Through The Net: Defining The Digital Divide: A Report on the Telecommunications and Information Technology Gap in America,* U.S. Department of Commerce, July,1999, page xiii.

households with low levels of education and income use the internet regularly (less than 20%).


Households with a Regular Internet User
Clusters of Socioeconomic Status, Saskatchewan, 1998
# of Sask. Households
University degree, income $60,000+
20,450
High school/some post-secondary, employed, income $60,000+
43,760
University degree, income < $60,000
30,770
High school/some post-secondary, employed, income $36,000 - $60,000
50,800
High school/some post-secondary, employed, income less than $36,000
68,750
Less than high school, employed
53,750
High school/some post-secondary, not employed
53,900
Less than high school, not employed
73,080
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100 %
% of households with a regular internet user

Source: Doug Elliot, *Sask Trends Monitor*, Regina, Vol.XVI, Number 10, October, 1999.

Access to computers and the Internet is likely more a function of the factors discussed above than other variables such as rural or urban location, gender or ancestry. It is estimated, for example, that at least 40% of farm households in Saskatchewan has a home computer, comparable to the provincial rate. The availability of low speed internet throughout the province at a flat rate has eliminated cost differentials by location as a barrier. However, many small communities and rural areas do not have access to high speed internet, which greatly improves information quality and the potential for educational applications.

Current patterns in access to computers and the internet have implications for the province and post-secondary education and training. If poverty is defined as a lack of resources to participate fully in our society, those residents who are already disadvantaged by reasons of low income or education may fall further behind without access to technology and computer literacy skills. These residents will be increasingly excluded from communications and information available through technology for purposes such as employee recruitment and hiring, application for public services, and access to a range of private goods and services. With lower levels of technological literacy within the population, Saskatchewan risks being ill-prepared to take advantage of the burgeoning opportunities for connecting with

others around the world to develop and share cultural resources and to expand business opportunities through e-commerce.

TEL can assist the province in working towards greater social equity by:

- Serving as a vehicle for people to acquire technological literacy skills, either as training on its own or through its incorporation into other educational content or programs;
- Extending access to computers and telecommunications for educational purposes for people who cannot afford them at home or do not have access in the workplace.
- Offering learning opportunities in ways that are accessible and affordable for lower income groups.

III. Key Developments and Challenges

1. A History of Innovation and Collaboration in Distance Education

Saskatchewan has a long history of practical innovation and collaboration in distance education. The nature of the province, with a relatively small population dispersed over a large geographic area, has required public institutions to devise a variety of ways to serve off-campus learners. Saskatchewan institutions pioneered effective models of extension services in their early days. For example, the University of Saskatchewan began delivering correspondence courses in 1929 and was an early leader in the use of radio for distance learning. In the 1980s, provincial institutions formed one of Canada's first inter-institutional consortia or "telelearning" associations using satellite technology to broadcast university courses.

For the past decade, post-secondary institutions and high schools have partnered with the Saskatchewan Communications Network (SCN) to expand distance learning opportunities in rural and northern regions. SCN's training network carries televised delivery of university and SIAST courses to over 50 communities, using one-way video and two-way audio live interactive programming. Regional colleges manage SCN learning centres and provide support and counselling for students. In 1998/99, a total of 49 credit courses were offered. Post-secondary institutions work collaboratively to set the annual list of offerings to ensure courses are complementary and address identified needs.

SCN is adapting to growing demands for technical support and guidance on alternative distance education delivery methods. In the last few years, SCN has:

- Created a Multimedia Unit providing services to the education sector such as operating and hosting servers, procuring licenses for software such as WebCT and ClassPoint, advising on hardware and systems configuration, and offering help desk services for technical staff at the local level.
- Experimented with SaskTel to provide video streaming to high schools using one of SCN's satellite channels, allowing for asynchronous delivery of televised courses.
- Participated in discussions with representatives from Manitoba's post-secondary system and learning network (MERLIN) to use SCN's satellite delivery network for program delivery in that province, opening possibilities for inter-provincial cooperation in offering and recognizing post-secondary education and training courses.

In addition to SCN, since 1995 the province's Multimedia Program Development and Support Fund has provided annual seed funding for the universities and SIAST to develop new approaches to teaching and learning using technology. Over 60 projects have received funds for a wide range of innovations, including production of

interactive CD-ROM and web-based materials to full courses designed in multiple formats. The fund emphasizes collaboration and has helped lever in-kind and financial support totaling nearly four times the provincial government contribution, for an annual investment of approximately $1 million.

2. Current Priorities and Plans

The federal and provincial governments and post-secondary institutions have high interest in fostering effective uses of technology for the benefit of individuals, communities, institutions, the economy and Saskatchewan as a whole. Each of these major partners has identified technology enhanced learning as a priority and is taking steps to expand applications and infrastructure to support TEL.

Federal Priorities

The Government of Canada has been a leading champion for TEL with an aggressive "connecting Canadians" agenda. Programs such as SchoolNet, Community Access, Smart Communities, and Multimedia Learnware are helping to give all Canadians access to the new information and telecommunications technologies. Through federal initiatives, Saskatchewan now has 192 community access sites, 766 SchoolNet sites, and 320 libraries connected to the Internet.

A key objective for Industry Canada in investing in technology and connectivity for Canadians is improving national productivity. Economic growth and productivity increases are more likely to occur in knowledge-based industries that will meet world demands for information technology products. Education falls into this category, with the global web-based learning market estimated to grow to $8.3 billion by 2002. This represents a major market opportunity for Canada.

Provincial Priorities

Saskatchewan's priorities for post-secondary education and training, and social and economic development, recognize the importance of information and communications technologies in the province's future.

The *Saskatchewan Training Strategy* and the *University Revitalization* process both highlight the need to integrate and use technology within post-secondary education to achieve priorities for access, quality, flexibility and innovation in serving learners, employers and communities. These objectives are built into the province's *Strategic Plan for Saskatchewan Post-Secondary Education and Skills Training: 2000-01 to 2004-05*. To advance these priorities, the province has taken a lead role in working with partners to develop the Action Plan for technology enhanced learning and to seek resources for implementation. The province's 2000-01 budget provides $1.406 in new funding for TEL initiatives.

The province's key economic development priorities include several objectives where TEL has direct relevance, including:

- Provide education and training for a strong Saskatchewan economy;
- Increase Aboriginal peoples' economic opportunities and participation;
- Advance strategic sectors in the economy, such as information technology and telecommunications;
- Enhance electronic delivery of provincial government services and provide a platform for businesses and non-government agencies to deliver electronic services;
- Increase research and development, and technology commercialization and adoption;
- Provide opportunities for communities to manage their economic future.

The province's technological infrastructure will be critical in realizing these objectives. Without affordable, high speed internet access, Saskatchewan researchers, businesses, communities, and educational institutions will not be able to participate fully in global knowledge and information networks and the economic opportunities that are possible when the barriers of distance and local market size are eliminated.

To address this reality, the province is developing *CommunityNet* in partnership with SaskTel. *CommunityNet* is a shared advanced communications network that will give all schools, post-secondary institutions, health facilities and government offices access to high speed Internet regardless of location at an affordable cost. The proposed network will greatly increase bandwidth in urban, rural and northern Saskatchewan, benefiting communities and businesses as well as public services. This cooperative model, leading to a common network throughout the province, will create "state of the art" infrastructure and connectivity in Canada. The province is seeking federal participation in supporting implementation of *CommunityNet*.

Institutional Priorities

Saskatchewan's post-secondary sector is incorporating technology enhanced learning into institutional plans and priorities on several fronts. All of the major partners are taking action to assess their readiness to participate more fully in TEL, to identify the most strategic areas to focus their efforts, and to develop specific projects or initiatives. The following are highlights:

- SIAST has developed a Virtual Campus Plan that envisions making all technical education and training programs available in alternative formats over the long-term. A new curriculum model has been adopted to increase flexibility to offer programs on or off-campus, in workplaces and communities, and at home. The

recent Report of the SIAST Review Committee confirmed the importance of these initiatives to the institution's future ability to enhance access and labour market responsiveness.

Four priorities have been targeted for applying TEL in the short-term: training linked to economic development such as small business development, forestry and mining; training for health care professions; basic education needs such as math and science; and training in electronic commerce for business. SIAST's plan is based on partnerships with a wide range of organizations including the universities, regional colleges, the Apprenticeship Commission, federal and provincial government departments, economic development agencies and industry.

- The province's eight regional colleges are participating in a number of initiatives and pilot projects to increase TEL opportunities in rural and northern areas. For example, testing is underway with the universities for use of video-conferencing and web-based learning modules to deliver post-secondary classes. A Basic Education Rural Access Program is being designed to include travelling instructors, an online instructor and community tutors to offer individualized basic education for adults. Some colleges are also beginning to offer online non-credit courses in subjects such as web page design.

  A recent review of the regional colleges, released in May 2000 and authored by provincial government and college representatives, outlines a new future direction for regional colleges as the nucleus for a provincial network of technology enhanced learning centres in rural and northern Saskatchewan. The centres would assist individuals, employers and communities in gaining access to the expanding array of education and training opportunities becoming available through electronic means from Saskatchewan post-secondary institutions and from beyond the province's borders.

- The University of Regina envisions providing students with the most accessible opportunities possible by making appropriate use of TEL for both distance education and campus-based initiatives. The creation of a New Media Learning Centre in the Research Park and an Information Hub are priorities. The New Media Centre will stimulate and support the integration of technology into teaching, learning and research. The Information Hub will provide learners and instructors with access to materials via technology to support their needs for information whether they are at home, in the office or in the classroom.

  Recently, the university announced a number of TEL related initiatives to be started in 2000-01. These initiatives include plans to:

  - Renew computers every four years for faculty, staff and teaching labs;
  - Expand the number of computer laboratory stations;
  - Introduce new multi-media technology into eight classrooms across the campus;

- Increase the campus' digital network by a factor of ten to better support TEL.

Priorities for TEL course development in the future will be determined by provincial need, through consultation and collaboration with post-secondary partners and by encouraging initiatives that support the university's identified strengths. The university's academic planning process has sparked discussion of the institution's mandate. Some fundamental, institution-wide priorities emerging through these discussions include a focus on liberal education, program flexibility, diversity, and Aboriginal education. Some thematic priorities include: social justice, health (wellness and administration), environment and energy, and informatics. While institutional priorities continue to be refined, they will help govern the development an appropriate array of course offerings using TEL that demonstrates quality, responsiveness to demand, and complementarity with offerings from other institutions.

- The University of Saskatchewan has engaged in extensive TEL planning to position itself for the future, including studies of infrastructure and computer needs, faculty and staff TEL needs assessments, determination of academic priorities and the establishment of a Centre for Teaching and Learning. The university has several decentralized centres of expertise in TEL and will be developing ways to coordinate them in a horizontally integrated fashion. The university also has developed plans to upgrade classrooms with technology through a core of high-end "smart" classrooms and portable multi-media consoles.

  Although the university currently offers approximately 100 distance education courses, it has not moved quickly into online delivery because of lack of Internet access for many learners in rural and northern Saskatchewan. With expansion of Internet access, the university is now poised to change its direction. Institutional planning and priorities for TEL development will take into account the following:

  - Areas identified for expanded funding and development through the university's Framework for Academic Planning document and its Priority Determination Process, including the identification of biotechnology and toxicology as priorities;
  - Institutional strengths such as agriculture, administration of rural schools, and mathematics and science for Aboriginal learners;
  - Conversion of existing distance education courses when the interactive capabilities of online, asynchronous delivery would be suitable for the subject matter and intended learners;
  - Programs with the goal of assisting learners to make the transition to post-secondary study (e.g. math readiness) and retaining students in their programs by ensuring they have strong basic academic skills;

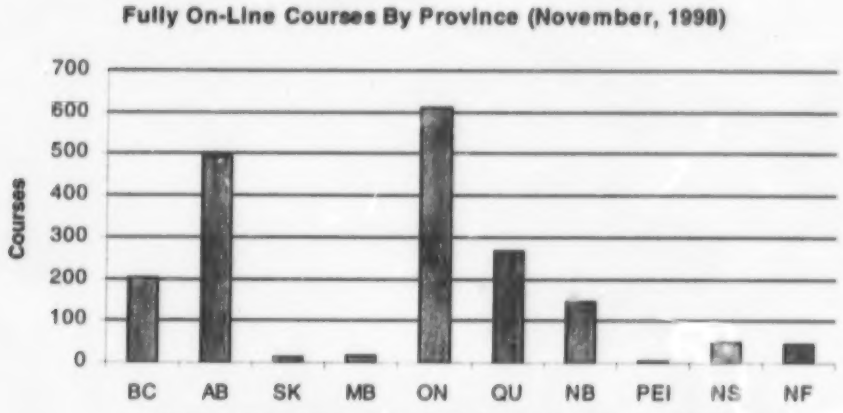
- Opportunities to work with the private sector to develop new TEL applications and content in strategic areas and building on existing corporate sponsorship of programs;
- Opportunities to work with Aboriginal institutions to enhance and develop TEL resources for First Nations and Métis learners.
- Potential to build on existing distance education consortia with other institutions in Saskatchewan and elsewhere.

3. Barriers to Use of TEL

In order to benefit from its advantages and progress to date, Saskatchewan must address key barriers that are limiting the full use of technology in post-secondary education and training. These barriers include the following:

Lack of TEL Content

Resource constraints have prevented Saskatchewan institutions from developing a range of applications using different technologies. There are far more proposals for developing content and instructional resources than can be supported each year with available funds and capacities. As shown in the following chart, Saskatchewan has one of the lowest numbers of fully online courses in Canada (less than 20).



Source: Technology-Mediated Learning: Current Initiatives and Implications for Higher Education, Report presented to CMEC, 1998

Although the above data are out-of-date, and there are difficulties in the accurate measurement of use of technology, rough estimates seem to bear out the picture in a general way. For example, the University of Manitoba estimates that about 1 in 5 of its courses now includes a web-based component and this ratio will fall next year to 1 in 2.5. In comparison, the University of Regina estimates that 1 in 25 of its courses would fall in this category.

Insufficient Support and Professional Development For Faculty

TEL applications will not be developed and implemented without the active participation of faculty. While many faculty in Saskatchewan institutions have incorporated TEL into courses on their own, or with support from the provincial Multimedia Program Development and Support Fund, there is a pressing need for technical and instructional design assistance for the majority to adopt TEL as part of their professional practice. This was strongly expressed, for example, in a major needs assessment study at the University of Saskatchewan.

During the development of this Action Plan, activities to identify faculty interest and needs in implementing TEL resulted in a ground swell of ideas and possibilities. However, many program areas also identified a requirement for faculty support to put these ideas for teaching and learning into practice.

All institutions are mindful of the importance of an open dialogue with faculty to address the legitimate concerns they may have about TEL, such as potential implications for interaction with students, the quality of teaching, workloads, and intellectual property rights, copyright and royalties.

Support for Learners

As Saskatchewan institutions endeavour to increase TEL content and applications, they will also need to enhance services that learners need to benefit from new modes of delivery. Learners and faculty will disengage from TEL if they are not able to access and use technologies in a convenient and effective way. For example, students located at home, in the workplace or in classrooms or learning centres often require technical "help desk" support, in addition to assistance in using a computer, learning independently, and making informed decisions about course and program offerings.

At the present time, all Saskatchewan institutions provide a range of services for learners on-campus and at a distance. However, none have significant experience or investment in supporting learners in an online, multi-mode or asynchronous environment. As well, provincial institutions do not have a system-wide approach to issues such as credit transfer and prior learning assessment and recognition (PLAR) which become more important to learners when they are able to take courses from a variety of sources. Learners will need increasing assistance, and support through institutional policies and services, to develop a coherent program of study leading to a recognized credential.

Technology Deficits

Recent reviews of the universities, SIAST and the regional colleges have all identified technology deficits within the institutions. While institutions are addressing these pressures as part of their overall operating plans, TEL is generating additional

demands. For example, regional colleges will not be able to serve as points for computer and Internet access for rural and northern residents without equipping learning centres for this purpose. Similarly, the universities and SIAST will not be able to take advantage of enhanced provincial capabilities for high speed Internet and videoconferencing technologies without more classrooms equipped to bring these multi-modes of delivery to students.

4. Summary of Saskatchewan's Position

The discussion outlined above portrays a post-secondary sector that is ready to adopt and expand use of TEL as a key strategy to achieve its purposes. Although there are significant barriers, they are the kind that can be overcome through planning, dialogue, collaboration and investment.

Saskatchewan has features that make the province especially well-positioned in Canada to create a unique province-wide action plan for technology enhanced learning, with its tradition of cooperation among institutions and a relatively well-articulated framework of roles, responsibilities and inter-relationships among the partners. In some respects, the province has had a "virtual" approach to post-secondary education for years based on a "distributed learning" model involving the two major universities, one technical institute with multi-site delivery across the province, and a system of regional colleges that act as the agent to make post-secondary opportunities available in rural and northern areas. Similar partnerships have evolved with First Nations and Métis institutions and the industry-led Apprenticeship and Trade Certification Commission to deliver post-secondary education to its constituents.

In summary, the province's post-secondary sector offers:

- A high level of collaboration among the main partners in post-secondary education and training that is unsurpassed in Canada;
- A history of partnership, experimentation and innovation in using technology to reach learners where they live and work;
- The beginnings within institutional faculty of a critical mass of knowledge and experience in using new media and technologies for educational purposes;
- A cooperative network infrastructure for high speed access to the information highway that will allow for quality, affordable TEL applications throughout the province;
- Provincial and institutional commitments to make significant progress in implementing TEL.

IV. A Framework For The TEL Action Plan

1. Introduction

The province and institutional partners have agreed that a plan is needed to focus attention and effort on common goals and barriers and to serve as a springboard for action in technology enhanced learning. The following framework has been devised with a five year time horizon in mind to allow for sufficient breadth of vision and time to implement real change.

Our approach is built on the understanding that technology is rapidly evolving in ways that cannot be predicted in the short-term and that applications depending on creativity are not well served by a rigid, lock-step orientation. A plan for technology enhanced learning requires flexibility to respond to a multitude of emerging demands for education and training in the province, to quickly seize new opportunities, and to nurture innovation as it occurs.

2. Vision

The following vision statement will guide Saskatchewan's use and management of technology enhanced learning within post-secondary education and training:

> ***Saskatchewan's post-secondary education and training sector works collaboratively to make appropriate use of technology to serve the learning needs of all residents of the province by enhancing the quality of programs and extending access.***

Access and quality are emphasized in this vision statement, reflecting their importance to the people of the province and their centrality to each of the post-secondary partners in carrying out their mandates. The appropriate use of technology through collaboration serves the learning needs of all residents, placing the student at the heart of our collective efforts.

The schematic diagram on the following page presents an overview of the TEL Action Plan, encompassing the goals and actions that flow from the vision statement. As the diagram shows, the Action Plan is a framework under which individual institutions and partners can formulate and coordinate their unique plans for TEL, and a mechanism for focussing on strategic collaborative actions with province-wide impact.

Technology Enhanced Learning Action Plan

Vision

Saskatchewan's post-secondary education and training sector works collaboratively to make appropriate use of technology to serve the learning needs of all residents of the province by enhancing the quality of programs and extending access.

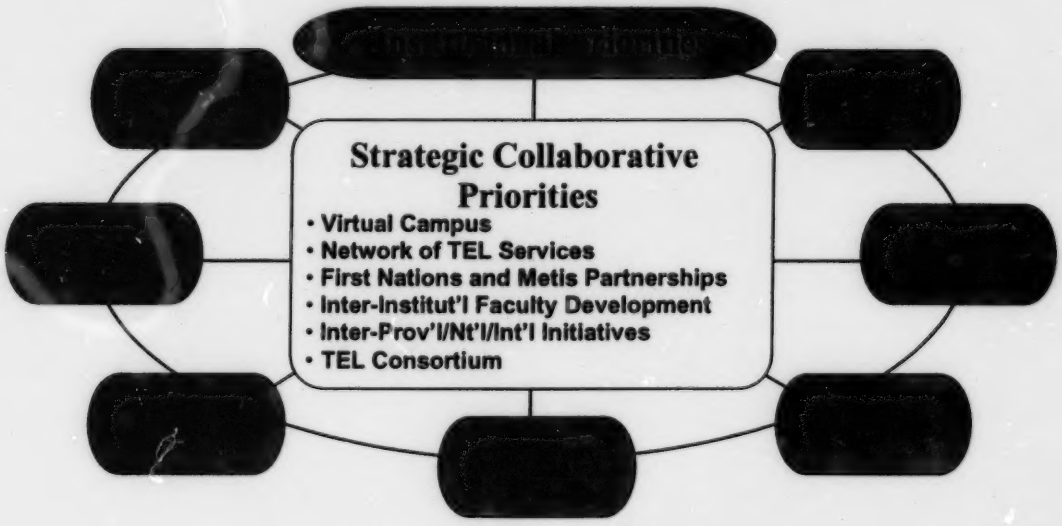
Goals

- Advance education and training in rural and northern communities
- Develop and retain students, graduates and faculty for a knowledge-based society
- Enhance Métis and First Nations peoples' education and training
- Develop Saskatchewan's intellectual capital

Enablers

- TEL content development
- Faculty development and support
- Learner support and connectivity
- Management and coordination
- Linkages with industry, communities, and other organizations

Actions



3. Principles

The key values underlying our vision are encapsulated in the following principles that guide all components of the TEL Action Plan:

Equity

TEL should strive to ensure access to educational opportunities, regardless of the learner's place of residence, socio-economic circumstances or demographic characteristics.

Quality

Use of technology in post-secondary education and training should reflect content and instructional strategies that meet accepted academic, pedagogical and industry standards.

Choice

TEL should lead to more flexible, responsive, relevant and timely programs and services to meet individual and labour market needs by providing greater choice in content or programs and multi-mode access.

Coherence

Developments in TEL should contribute to creating a coherent and integrated delivery system and program array for post-secondary education and training in the province to increase opportunities and mobility for learners and to make the best use of resources.

Sustainability

A technologically enhanced learning environment should be sustainable in the long term, supported by organizations on an ongoing basis within available resources.

Partnerships

Partners in education and training, industry, communities, and telecommunications organizations should work together on the basis of mutual interests, complementary strengths, and shared responsibilities for meeting the learning needs of Saskatchewan people.

4. Goals

Four goals have been identified as the most important desired ends that will be achieved through technology enhanced learning in Saskatchewan over the long

term. These goals reflect shared interests and challenges where TEL has high potential to contribute solutions and to address pressing economic and social issues facing learners, communities and the province as a whole. The goals for the TEL Action Plan are as follows:

A. Advance Education and Training In Rural and Northern Communities

TEL will contribute to addressing the needs of rural and northern residents for affordable, flexible access to post-secondary education and training in their home communities and to preparing a skilled work force for building a stronger, more diversified rural and northern economy. TEL will support community and regional efforts to extend learning opportunities based on identified needs related to social and economic development, building the capacity of communities to improve their sustainability and quality of life.

B. Enhance First Nations and Métis Peoples' Education and Training

TEL will be used to increase access to learning opportunities for First Nations and Métis people, using curriculum and learning models that are relevant to the cultural context, needs and preferences of First Nations and Métis peoples and communities. The provincial post-secondary sector will work together with First Nations and Métis institutions to enhance their capacity for TEL and to develop programs, resources, instructional strategies and delivery methods that support First Nations and Métis participation and success in post-secondary education and training.

C. Develop and Retain Students, Graduates and Faculty For A Knowledge-Based Society

TEL will be used to develop and retain knowledge, expertise and skills in the province. Applications will assist Saskatchewan people and industry to prosper in a knowledge-based society where high levels of technological literacy, innovation and advanced skills are essential throughout the population. The attractiveness and reputation of Saskatchewan's post-secondary sector will be enhanced by incorporating TEL in ways that enrich curricula and learning environments. This in turn will contribute to attracting expert faculty, researchers and students.

D. Develop Saskatchewan' Intellectual Capital

TEL will be a means for developing Saskatchewan's intellectual capabilities in information technologies and in a range of niche specialties where the province's post-secondary sector can achieve national and international stature for its programs and services. Research and development in the province will be strengthened by using TEL to attract private and public sector investment for creating new information technology products and applications for export

markets, as well as for educational purposes in the province. TEL will complement provincial efforts to develop strategic knowledge-based and value-added industries that build on our unique strengths in the global economy.

5. Enablers

The TEL Action Plan depends on five key "enablers" to achieve in the plan's vision statement and goals. These "enablers" contribute to the realization of each of the goals and identify spheres of action that need focussed attention, coordinated effort and sustained investment. It will be necessary to move forward in each of these areas simultaneously because they are inter-dependent. To illustrate, faculty support in using technology is critical to make progress in developing TEL content, and in order to reach learners effectively, connectivity and support services for students must be addressed.

The key enablers for the TEL Action Plan, and specific strategies associated with them, are as follows:

A. Develop TEL Content and Instructional Strategies

Build on existing capacity and models of delivery to support development of courseware and instructional strategies using information and communications technologies. A target of developing at least 200 online courses is proposed based on provincial, regional and industry sector priorities. These priorities will:

- Enhance post-secondary education and training opportunities linked to key industry, employment and research sectors in the province.
- Provide post-secondary education and training opportunities that respond to identified needs in rural and northern Saskatchewan.
- Increase options for adults to develop basic academic, literacy and math skills required for entry to post-secondary education and training, and to employment.
- Extend and expand flexibility and access to apprenticeship training.
- Enhance access to and success in education and training programs for First Nations and Métis people.

B. Faculty Development and Support

Provide opportunities for faculty development and support in using technology to design and deliver courses, using a multi-faceted approach including technical training and support, tools for integrating technology into teaching and learning, and participation in evaluation and research on best practices.

- Develop onsite and virtual resources for faculty training in instructional design and teaching using TEL.

- Establish networks to provide professional development workshops, in-service and peer support for faculty throughout the province.
- Provide media production and technical support for faculty in implementing TEL initiatives.
- Undertake research and evaluation in the effectiveness of TEL and disseminate results for continuous learning and professional development.

C. Learner Support Services and Networks

Provide academic and technical support for learners to participate in TEL opportunities. Academic support includes counseling in course/program selection, tutoring support for independent learning, access to library resources, and interaction with instructors and peers. Technical support includes access to computers, the Internet and other telecommunications technologies, help desk services, and computer skills.

- Establish a province-wide network of technology enhanced learning centres to support access for learners to multi-mode TEL opportunities, building on existing facilities and services.
- Upgrade on-campus computer facilities, labs and classrooms to support TEL delivery, programs and services.
- Work with the provincial library system to coordinate and enhance learning resources for students in courses or programs delivered using TEL.

D. Management and Coordination

Build on existing cooperative mechanisms to ensure system-wide collaboration involving a broad range of stakeholders in implementing and managing the TEL Action Plan.

- Establish mechanisms for system-wide management and coordination of the TEL Action Plan to provide leadership and policy direction, and processes for priority-setting, program planning, and evaluation.
- Create inter-agency partnerships to undertake joint action in implementing the TEL Action Plan and to lever funding.
- Strengthen needs identification and assessment processes at the provincial, regional and industry sector levels to provide a basis for determining priorities for TEL and to support the development of collaborative responses.

E. Linkages With Industry, Communities, and Other Organizations

Encourage partnerships with organizations beyond the provincial post-secondary sector, such as industry and communities, to strengthen institutional capacity and

relevance in TEL applications and to pursue joint interests with these organizations where mutual benefits are possible.

- Forge private and public sector partnerships to develop TEL content, to research and support TEL applications, and to enhance technological infrastructure and connectivity.
- Work with communities, industry and the public sector to identify and implement ways to use TEL to meet identified education and training needs.
- Pursue inter-institutional, inter-provincial and national avenues for collaboration and cooperation in expanding TEL opportunities.

6. Actions

The TEL Action Plan promotes system-wide change to achieve the collective goals of the framework through the efforts of many partners. It also takes into account that the post-secondary sector is made up of many diverse organizations with different mandates, client groups, modes of operation, and states of readiness and capacity for TEL. Recognizing both diversity and common interests, the plan encompasses two broad areas for action:

- **Strategic Collaborative Priorities:** Include joint efforts that will:
  - Address major issues and challenges facing learners, the province and the post-secondary sector;
  - Have high impact in producing results; and
  - Create substantial momentum towards realizing the TEL vision and goals across the system.
- **Institutional Priorities:** Include the specific plans and actions that individual institutions will undertake to incorporate and advance TEL within their particular setting, guided by the framework of the TEL Action Plan. For example, Saskatchewan post-secondary institutions are addressing the TEL "enablers" in various ways, such as increasing opportunities for faculty development in using TEL and strengthening information technology infrastructure to support TEL. The Action Plan provides a shared framework for institutions to coordinate their individual plans and to work towards the same ends using means appropriate to their circumstances.

A. Strategic Collaborative Priorities

The following priorities have been identified as the most important collaborative initiatives that the post-secondary sector as a system should implement in the next few years. The key features of these initiatives are described below in general terms, to be fleshed out and refined through more detailed work in the next phase of the Action Plan.

- **Saskatchewan Virtual Campus**

  A Saskatchewan Virtual Campus would provide enhanced access for learners, in the province and elsewhere, to a broad range of courses and programs in alternative formats. In keeping with the framework of the TEL Action Plan, the Virtual Campus would be designed to deliver flexible, responsive opportunities that increase choice and mobility for learners in urban, rural and northern settings through a partnership approach. The main elements of a Virtual Campus tailored to Saskatchewan needs would include:

  - A "one-stop" web-site or portal for learners to facilitate access to education and training opportunities available in different formats and modes including online courses and programs, SCN televised options, independent study, and traditional face-to-face delivery on and off-campus.

  - An expanded array of online courses and programs that respond to identified student, industry and community priorities for TEL content development and maximize possibilities for students to earn all or part of a credential.

  - Enhanced credit transfer and recognition to support access, mobility and program completion for students. Pre-arranged, automatic credit transfer arrangements will be developed where appropriate, along with an electronic transfer guide for students and counsellors.

  - A streamlined admission process for students taking courses from different institutions and linkages to online registration procedures.

  - Linkages to a range of student services including prior learning assessment and recognition, student financial assistance, academic and career counselling, library resources, and other support.

  Because of the complexity involved in creating a Virtual Campus, the province's three public credit-granting institutions, the two universities a. d SIAST, will form a "Providers Group" to undertake the initial work in developing the concept and implementing it.

  The Providers Group will consult with a range of partners in the post-secondary system and related agencies, who have an important role in supporting learners and delivering specialized forms of post-secondary education, training and related services, for example, regional colleges, the Apprenticeship and Trade Certification Commission, First Nations and Métis institutions, Fransaskois organizations, industry groups and private schools. The Virtual Campus model will encourage connections among many partners through electronic links, as well as organizational relationships.

- **Network of Technology Enhanced Learning Services**

  A network of technology enhanced learning services across the province would provide the necessary support and connectivity required by many learners to access TEL and to be successful in their studies. The services would be developed in conjunction with the Saskatchewan Virtual Campus, ensuring that learners throughout the province can benefit fully from expanded online courses and programs, as well as opportunities available through other modes.

  In rural and northern areas, the new network of technology enhanced learning services would be joined with the current responsibilities of regional colleges for identifying education and training needs, administering distance education opportunities at the local level and providing student services in learning centres. CommunityNet, the province's advanced communications network, would support colleges in taking on a new role in TEL by making available high speed Internet access at an affordable cost. In the major cities, SIAST and the universities would develop enhanced services and facilities that support access to TEL opportunities for learners on-campus. Academic and technical support for learners would include:

  - Access to computers, the Internet, phone/fax/e-mail communications, other learning technologies such as video-conferencing and televised delivery, and help desk support;

  - Training in computer skills, self-directed learning, study skills, and basic academic readiness and knowledge to succeed at the post-secondary level;

  - Counselling and information to assist learners in making informed decisions about TEL options, backed by a provincial network of expertise among academic advisors on the quality, recognition and appropriateness of various TEL courses and programs to different learning needs;

  - Student services such as tutoring, testing and examinations, access to instructional and library resources, group learning activities, and peer support;

  - Linkages to Canada-Saskatchewan Career and Employment Services for labour market information, income support, job placement, and other career resources.

  In addition to serving individual learners, the network would provide services to communities and employers in the application of TEL to meet their needs. This service would build on the current mandates and expertise of SIAST and regional colleges as the leading provincial institutions for work-based training and community education to support local social and economic development.

- **First Nations and Métis Partnerships**

  New partnerships with First Nations and Métis institutions would be developed to ensure that the goal of the TEL Action Plan to enhance education and training opportunities for First Nations and Métis people is met. Achieving this goal requires a focus on TEL content development and instructional strategies, faculty development, and learner support specifically tailored to First Nations and Métis contexts.

  The nature of these partnerships would be determined through dialogue involving First Nations and Métis institutions, public post-secondary institutions, government representatives and other groups where appropriate. There may be a number of potential linkages with other strategies or forums where education and training are important considerations such as the Northern Development Strategy, First Nations and Métis economic development initiatives, and the Common Labour Market Planning Forums.

- **Inter-Provincial, National and International Initiatives**

  Initiatives with an orientation to partnerships and markets beyond the province's borders would be advanced to expand opportunities for Saskatchewan learners and to strengthen the quality and reputation of Saskatchewan programs in a range of specialty fields, particularly those where the province has recognized, unique expertise. These initiatives would take several forms such as:

  - Joint projects or agreements with institutions in other provinces (e.g. CampusWest, Campus Manitoba, SIAST-SAIT partnership) for sharing curriculum and instructional resources, developing complementary TEL courses and programs, extending credit transfer, brokering courses or programs, and developing common or linked web-sites for student access to TEL offerings from several institutions.

  - Development of courses or programs for export markets in niche areas that build on institutional program and research strengths (e.g. Virtual Biotechnology College), with potential opportunities to partner with institutions in other countries for international delivery.

  - Potential opportunities for business participation in development or marketing of post-secondary courses or programs in concert with economic development initiatives and priorities.

  Saskatchewan institutions will collaborate with each other where possible to pursue a variety out-of-province opportunities, where there are mutual advantages for the institutions.

- **Inter-Institutional Faculty Development**

  Inter-institutional faculty development would entail the development, delivery, and sharing of a variety of resources to meet common needs across the post-secondary sector. Examples include training modules and other learning resources, professional development events, workshops or seminars, and peer support networks. A focus on high quality, user-friendly online resources would be used as an instructional tool by modeling effective technology enhanced teaching and learning.

  Collaborative actions would be designed to complement the individual, in-house resources and activities devoted to faculty development and support for TEL within institutions. Inter-institutional cooperation would reduce potential duplication of effort and provide enriched professional development support that might not be otherwise possible. There are also increased opportunities today to benefit from online resources for faculty development and support through collaboration with out-of-province institutions and organizations.

- **TEL Consortium**

  The creation of a Technology Enhanced Learning Consortium would provide a vehicle for overall coordination of the TEL Action Plan by fostering the development and implementation of collaborative priorities and coordination among institutions and related agencies. The specific members within the consortium and terms of reference require more detailed work and consultation. The challenge will be to develop an approach that results in action, engages members on the issues where they have a clear interest, and has the flexibility to accommodate organizations with diverse mandates and perspectives.

B. Institutional Priorities

The province's three major credit granting post-secondary institutions, SIAST, the University of Saskatchewan and the University of Regina, have their preliminary priorities and plans for enhancing TEL. The chart below presents the highlights of these plans linked to each of the five enablers within the TEL Action Plan and the strategic collaborative priorities discussed above. The next phase of developing the TEL Action Plan will focus on refining and prioritizing these proposals and broadening the plan to include the contributions of other partners.

Enabler 1 – Develop TEL Content and Instructional Strategies	
Strategies	**Institutional Priorities**
1.1 Enhance post-secondary education and training opportunities linked to key industry, employment and research sectors in the province.	**SIAST:** • Develop 80 courses for synchronous and asynchronous delivery with priorities in economic development, health, information technology, basic education and sectors identified in collaboration with regional colleges. • Basic Education and Bridging: ➢ Convert bridging programs in pre-nursing, trades, technology and business to alternative formats. ➢ Numeracy Skills CD-ROM. ➢ Partner with regional colleges in online delivery. • Partner with Apprenticeship Commission to convert programs to alternative formats. • Develop nursing education courses in multi-mode with a focus on Aboriginal recruitment and retention. **University of Regina:** • Develop 60 web-based courses with priorities in liberal education, Aboriginal education, social justice, health, environment and energy, and informatics. **University of Saskatchewan:** • Develop online delivery for: ➢ A portion of existing distance education courses (100+) based on fit with audience and content and viability for reaching inter-provincial or international audiences. ➢ Disciplines that match university strategic priorities (e.g. biotechnology, toxicology, First Nations and Métis needs) ➢ Readiness courses in reading, writing, science and math. ➢ One professional graduate program where the university is a recognized national leader.
1.2 Provide post-secondary education and training opportunities that respond to identified needs in rural and northern Saskatchewan.	
1.3 Increase options for adults to develop basic academic, literacy and math skills required for entry to post-secondary education and training, and to employment.	
1.4 Extend and expand flexibility and access to apprenticeship training.	
1.5 Enhance access to and success in education and training programs for First Nations and Métis people.	

Enabler 2 – Faculty Development and Support	
Strategies	***Institutional Priorities***
2.1 Develop onsite and virtual resources for faculty training in instructional design and teaching using TEL.	**SIAST:** • Develop a "Greenhouse" model for faculty development at each campus with training centres and Prior Learning Assessment and Recognition centres. • Increase faculty training opportunities in synchronous and asynchronous distance delivery. • Introduce Banner Web for Faculty and Employees and Campus Pipeline. • Extend network to every faculty desktop and establish SIAST wide help desk. • Collaborate with universities and other partners in applied TEL research. **University of Regina:** • Establish a New Media Learning Centre in the university's Research Park to provide a focus for TEL research, development and training and support for faculty and students. • Expand the Teaching Development Centre's ability to meet TEL needs. **University of Saskatchewan:** • Expand the Centre for Teaching and Learning (CTL) to meet TEL demands in collaboration with the U of R • Develop a coordinated, horizontally integrated Virtual Information and Learning Commons, led by the CTL. • Enhance research into TEL, building on the work of several leading faculty.
2.2 Establish networks to provide professional development workshops, in-service and peer support for faculty throughout the province.	
2.3 Provide media production and technical support for faculty in implementing TEL initiatives.	
2.4 Undertake research and evaluation in the effectiveness of TEL and disseminate results for continuous learning and professional development.	

Enabler 3 – Learner Support Services and Networks	
Strategies	**Institutional Priorities**
3.1 Establish a province-wide network of technology enhanced learning services to support access for learners to online and multi-mode TEL opportunities, building on existing facilities and services. 3.2 Upgrade on-campus computer facilities, labs and classrooms to support TEL delivery, programs, and services. 3.3 Work with the provincial library system to coordinate and enhance learning resources for students in courses or programs delivered using TEL.	**SIAST:** • Develop computer labs on-campus and off-campus in cooperation with CAP sites and regional colleges. • Increase bandwidth by 100% and servers by 20% and upgrade WAN. • Learning Resources: ➢ Implement library web-based functionality/full MARCs system. ➢ Increase access to electronic journals and other learning resources. ➢ Further develop linkages to the provincial library network. • Computer replacement strategy. • Implement 1-800 help desk support. **University of Regina:.** • Increase smart classrooms, computer stations and labs, technical infrastructure for campus/distance learners. • Establish Information Hub for off and on-campus learners. • Develop integrated student-centred support and administrative systems for off and on-campus learners. **University of Saskatchewan:** • Expand A/V and Extension Services for TEL campus/distance education delivery. • Increase student support for access/connectivity, online support, computer labs and library services. • Complete plans smart classrooms and portable multimedia consoles. • Enhance library's capability to serve distance learners. **U of S and U of R:** • Work with Campus West.Ca to develop supports for distance learners and online resources for academic advising.

Enabler 4 – Management and Coordination	
Strategies	**Institutional Priorities**
4.1 Establish mechanisms for system-wide management and coordination of the TEL Action Plan to provide leadership and policy direction, and processes for priority setting, program planning and evaluation.	**All institutions and department:** • Establish collaborative processes through: ➢ TEL Consortium or a Steering Committee and Forum ➢ Program Planning and Evaluation Committee ➢ Inter-institutional/agency Task Teams to design and implement TEL Action Plan initiatives.
4.2 Create inter-agency partnerships to undertake joint action in implementing the TEL Action Plan and to lever funding.	• Refine, expand, and better coordinate existing needs assessment processes carried out by SIAST, regional colleges, the department, universities, and other agencies.
4.3 Strengthen needs identification and assessment processes at the provincial, regional and industry sector levels to provide a basis for determining priorities for TEL and to support the development of collaborative responses.	• Update operating protocols and agreements among institutions to encourage collaboration in TEL delivery, course or program brokerage, and projects (e.g. SIAST-Regional Colleges Protocol Agreement). **Saskatchewan Communications Network:** • Collaborate with post-secondary institutions and related agencies to develop SCN's future role and functions in supporting the TEL Action Plan.

Enabler 5 – Linkages With Industry, Communities, and Other Organizations	
Strategies	**Institutional Priorities**
5.1 Forge private and public sector partnerships to develop TEL content, to research and support TEL applications, and to enhance technological infrastructure and connectivity. 5.2 Work with communities, industry and the public sector to identify and implement ways to use TEL to meet identified education and training needs. 5.3 Pursue inter-institutional, inter-provincial and national avenues for collaboration and cooperation in expanding TEL opportunities.	**SIAST:** • Collaborate with Chamber of Commerce and other industry partners regarding business needs and potential TEL initiatives. • Investigate opportunities with SRNet and CA*net 3 for collaborative projects with other technical institutes. • Inter-provincial partnerships: ➢ Pursue common use of LearnLinc with SAIT, NAIT and Campus Manitoba. ➢ SAIT-SIAST partnership in first year technology . ➢ Explore links to Contact South in Ontario. ➢ Pursue potential brokering arrangements with other institutions. **University of Regina:** • Establish partnerships through the proposed New Media Learning Centre, involving public and private sector groups and organizations. **University of Saskatchewan:** • Work with Smart Communities initiative to enhance community-based TEL. • Partner with Inroads Solutions on Multimedia Learnware project. • Plan for sustainability of Cameco Access Program in Engineering and Sciences and continue partnership development with northern employers, Northlands College and northern university access programs. • Inter-provincial partnerships: ➢ Continue leadership role in CampusWest.Ca. ➢ Seek out partnerships with other major Canadian universities in agriculture program development and delivery. ➢ Investigate partnerships with Universities of Regina and Manitoba for joint delivery of online graduate program in educational administration.

7. Resource Implications

The TEL Action Plan will require considerable investment over its five-year timeframe and beyond to develop, implement and sustain changes across the post-secondary sector. Further work is needed with post-secondary institutions and related agencies to estimate detailed resource requirements and contributions from various partners. The initiatives outlined in the TEL Action Plan at this stage are scalable, providing flexibility to balance the magnitude and rate of change in implementing TEL with the available resources.

Although detailed costing has not been completed, it is clear that additional resources will be needed. For example, an investment of $10 million over five years would be required to produce 200 new online courses, assuming a cost of $50,000 per course. Costs per course may be somewhat lower or higher, depending on the approach to TEL content and accounting for expenses, but still would represent a level of expenditure that cannot be readily absorbed by the system.

The following identifies funding sources in the province that have already been specifically allocated for the TEL Action Plan and other resources that will be considered in developing the financial plan to support TEL:

- Provincial funding of $1.656 M available in the 2000-01 budget for TEL;
- Institutions' contributions, including in-kind resources, based on their internal prioritization of needs and activities related to TEL;
- New potential sources of capital funding for information technology infrastructure such as the province's Centenary Fund;
- Other potential partners, such as industry, who may contribute to specific aspects of TEL that respond to their needs;
- Cost recovery strategies that direct resources back into TEL development.

A proposed five-year partnership agreement with the federal government will be sought to complement provincial and institutional funding, particularly for initiatives that advance national goals and interests in increasing uses of technology in education and training.

V. Next Steps

This phase of the TEL Action Plan has provided the framework upon which to base future collaborative action and to further develop specific initiatives. Our next steps will include:

- Consultation with a wide range of post-secondary partners and related agencies to seek their participation in the continuing development and implementation of the TEL Action Plan and its priorities;

- Discussion with the federal government concerning their potential support for the plan and its various components;

- Detailed development work on the strategic collaborative priorities to move them into implementation.